

ITECH evaluation on the SmartSocket

Chapter for Standby Power Consumption

With the rapid development of the Internet of Things Industry, more and more intelligent devices come into our daily life. Smart socket is a typical sample, that it realizes the function control by phone App with the built-in Wi-Fi module. Most of the smart sockets in the market emphasize their intelligent functions on household. With the trends of energy-saving, the standby power consumption of home appliances is the basis of utilizing value. For example, the standby power of a LCD TV is 8.07W, it is 70.69kW/h for one year, and about ¥40.00 is wasted. Never overlook the standby power consumption of electrical appliances. Today, ITECH select a well-known brand smart socket randomly from the market and test the standby power consumption.



Figure 1 Smart socket

The standby power consumption is the electric power consumed by electronic and electrical appliances while they are switched off (but are designed to draw some power) or in a standby mode. The whole power consumption in standby mode comes from no load status of the power supply itself and the standby power consumption of main board. In this condition, the real power consumption of a power supply made by better materials is normally 5W ~ 10W. Now we will test the standby power consumption of DUT by IT9121 power analyzer and fixture IT-E185.

The power consumption measurement is the analysis and calculation based on the sampling of voltage and current in the power circuit. The analysis and calculation are made by professional equipment. The following figure shows the wiring diagram of the test. IT-E185 is integrated with good internal circuit and external terminals of voltage and current, which can be connected with the voltage and current terminals on the rear panel of IT9121 power analyzer directly. Test engineers do not need to manage connections in series/parallel, which is very convenient.

Put the smart socket into the test fixture, simply open the power switch of the smart socket (power indicator is red). As the main purpose of this test is to test the standby power consumption, no need to connect with any external electrical devices.



Figure2 Wiring Diagram of ITECH Evaluation

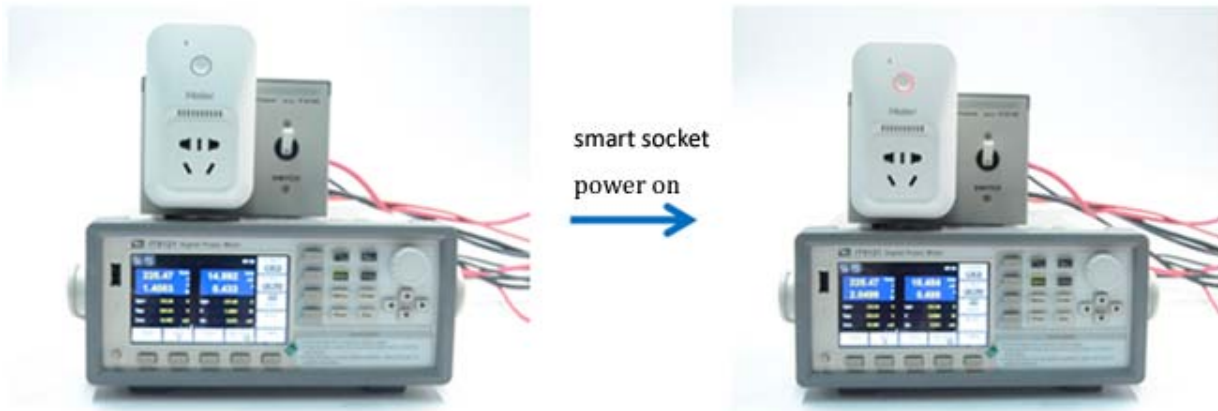


Figure3. The Ongoing Smart Socket Evaluation

The internal of the smart socket includes AC-DC power supply, wireless communication unit, relays and MCU control unit etc. So the internal elements start to work and generate slight operating current in standby mode. IT9121 power analyzer saved and output the testing data by screenshot function during the testing process for further data analysis. Through the analysis, we got the standby current is only 15mA and the standby power of the smart socket is less than 2W. In addition, the parameters displayed on the testing interface such as power factor, active power, frequency etc. that greatly helped the smart socket testing.

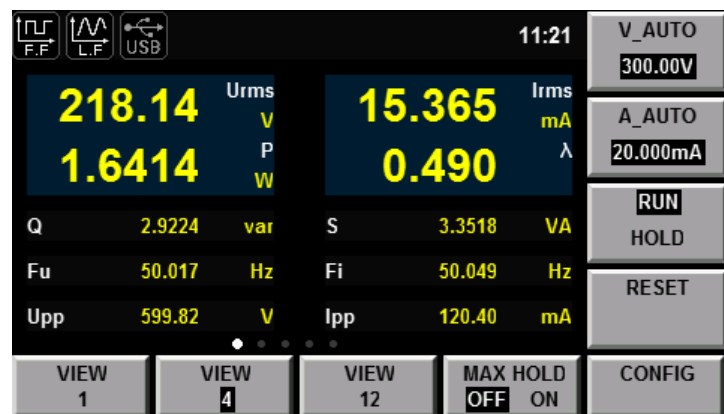


Figure 4. testing process saved by IT9121 screenshot

The functional operation of the smart socket is controlled through phone App. That's why we use smart sockets. When you are in the company, at school or on your way home, if you want to turn on the home appliances in your house, such as the hot-water heater or the light, you can realize the control by the App on your phone. That requires our smart socket keep connecting with the internet. So how much power it consumes in the standby state?



Through the testing we found that even controlled in LAN, the standby power consumption is still less than 2W. According to the survey from Center for Energy Conservation Product (CECP), one urban family has nearly or more than 10 types of household appliances with standby or reservation function. The average standby power consumption is between 15W and 30W. That accounts for about 10% of household electricity consumption. The smart socket helps users to cut off the power once the household appliances stop working. If every household adopts smart sockets to control the household appliances, that will save more energy and make a great contribution to the whole world. Many a little makes a mickle.